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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/409,163	09/30/1999	SHAWN X. GAO	037422.P006	4991

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EXAMINER

HARVEY, DIONNE

ART UNIT	PAPER NUMBER
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2643

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/409,163

Applicant(s)

GAO ET AL.

Examiner

Dionne N Harvey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 13-15,25-51,55 and 56 is/are allowed.
- 6) ☐ Claim(s) 1-12,16-24,52 and 53 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 U.S.C. § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-6,9-12,16,17, 20-24, 52 and 53 are rejected under 35 U.S.C. 102(b) as being anticipated by Soli (US 5,402,496).

Regarding claim 1, shown in figure 10, Soli teaches a feedback canceller for an audio amplification device (500) comprising: an adaptive filter (510); means for combining (600) an output of the adaptive filter (510) with an input of the audio amplification device; and a first band limiting filter (730) having an input (691) coupled to an output (540) of the audio amplification device and an output (740) coupled to the input of the adaptive filter (510), wherein the first band limiting filter has a pass band limited to a frequency band containing unstable frequencies, as broadly claimed (see column 9, lines 25-30; also see column 10, lines 47-49 and lines 60-65).

Regarding claim 2, Soli teaches an amplifier for aiding hearing (Soli teaches that the signal processor includes a filtered amplifier circuit; see column 5, lines 25-27).

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Regarding claim 3, Soli teaches digital implementation (column 4, line 25).

Regarding claim 4, In claim 5, Soli teaches that the adaptive filter is a FIR filter.

Regarding claim 5, in column 7, line 15-34, Soli teaches that the adaptive filter may be implemented with a normalized least mean square algorithm.

Regarding claim 6, Soli teaches that the first band limiting filter is digitally implemented (column 4, line 25).

Regarding claim 9, Soli teaches that the adaptive filter includes means for convolving the input of the adaptive filter with filter coefficients, thereby adapting so as to reduce feedback in the system.

Regarding claim 10, Soli teaches that the adaptive filter further comprises means for applying a scaling gain (block 450 in figure 2) to the filter coefficients.

Regarding claims 11 and 12, Soli teaches that the scaling gain is in the range of 2^{-3} to 2^3 .

Regarding claim 16, Soli teaches means for delaying (1710 in figure 7) the output of the audio amplification prior to the first band limiting filter (1720).

Regarding claim 17, Soli teaches that the audio amplification device is delayed by an amount of time that is a function of the feedback path (550, 570; also see column 9, lines 20-23).

Regarding claims 20,21 and 53, Soli teaches that the adaptive filter has an adjustable adaptation speed (see columns 6 and 7) as a function of the gain via sample period.

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Regarding claim 22 and 23, in column 7, lines 15-30, Soli teaches that the adaptation length is selectable via algorithm implementation.

Regarding claim 24, in figure 8, Soli teaches that the first band limiting filter (640) has a frequency response approximately matching a frequency response of a feedback path (570).

Regarding claim 52, Soli teaches means for storing filter coefficients for the first band limiter in delay line (410), as broadly claimed.

Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soli (US 5,402,496).

Regarding claims 7 and 8, In column 5, lines 47-51, Soli teaches that the pass-band filter (310) is preferably of the low-pass variety. Soli does not specifically teach that the band limiting filter comprises a high-pass filter. However, Soli teaches that cutoff frequency may be less than several hundred hertz and that a filter which would pass any noise spectrum desired to be removed from the input signal may be easily implemented. Therefore, Soli does not restrict to the use of only a low-pass filter. It would have been obvious for

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one of ordinary skill in the art at the time of the invention to use a high-pass filter instead of a low-pass filter, in an effort to capture a broader range of frequencies inside which "unstable frequencies" may be present.

3. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soli (US 5,402,496) in view of Williamson (US 5,027,410).

Regarding claims 18 and 19, Soli does not specifically teach that an AGC is coupled before the means for combining(280) such that the AGC output is combined with the output of the combination step. In column 7, lines 39-53, Williamson teaches that an AGC may be implemented as a pre-emphasis step before the means for combining a feedback cancellation circuit. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Soli and Williamson for the purpose of reducing the high frequency content of the signal to minimize aliasing.

Allowable Subject Matter

Claims 13-15, 25-51,54,55 and 56 are allowed.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statements for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dionne Harvey whose telephone number is (703) 305-1111. The examiner can normally be reached on Monday through Friday from 8:30am to 6:00pm.

Any responses to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, DC 20231

or faxed to:

(703) 308-6306, for formal communications for entry

Or:

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(703) 308-6296, for informal or draft communications, please label
"PROPOSED" or "DRAFT".

Hand delivered responses should be brought to Crystal Park II, 2121
Crystal Drive, Arlington, VA., Sixth Floor(Receptionist)

If attempts to reach the examiner by telephone are unsuccessful, the
examiner's supervisor, Curtis Kuntz, can be reached at (703) 305-4708.

Any inquiry concerning this communication or earlier
communications from the examiner should be directed to Dionne Harvey whose
telephone number is (703) 305-1111.

D.H.

April 15, 2004


HUYEN LE
PRIMARY EXAMINER